

# Troubleshoot SNMP Polling and Incorrect Interface Details on SNA

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## Introduction

This document describes how to troubleshoot missing exporter interface information in Secure Network Analytics

## Prerequisites

- Cisco recommends that you have basic Simple Network Management Protocol (SNMP) polling knowledge
- Cisco recommends that you have basic Secure Network Analytics (SNA/StealthWatch) knowledge

## Requirements

- SNA Manager in version 7.4.1 or newer
- SNA Flow Collector in version 7.4.1 or newer
- Exporter actively sending NetFlow to SNA

## Components Used

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command

- SNA Manager in version 7.4.1 or newer
- SNA Flow Collector in version 7.4.1 or newer
- SNMPwalk software
- Wireshark software

## Configurations

- Device Configuration: The exporters need to be configured to allow SNMP access. This involves configuring SNMP settings on each device, including setting up SNMP community strings, access control lists (ACLs), and defining the SNMP version to be used
- SNMP Polling Configuration on SNA: Upon successful configuration of the exporters, SNMP polling is enabled by default on the SMC using pre-set parameters. It is crucial to supply requisite details pertaining to the exporters, such as SNMP community strings and SNMP versions, to ensure the polling mechanism operates optimally

## Background information

SNA possesses the capability to provide comprehensive interface status reporting, along with the ability to display interface names for exporters that are actively transmitting NetFlow data to a Flow Collector. This interface detail can be seen by navigating to the Investigate -> Interfaces menu from the Manager Web UI.

Interface Status (Since Reset Hour)

INTERFACE	EXPORTER	CURRENT UTILIZATION	CURRENT TRAFFIC	MAXIMUM UTILIZATION	MAX TRAFFIC	DIRECTION	SPEED
▶ GigabitEthernet1 ...	...	0.01%	66.59 Kbps	0.18%	1.78 Mbps	INBOUND	1 Gbps
▶ GigabitEthernet1 ...	...	0%	27.96 Kbps	0.29%	2.9 Mbps	OUTBOUND	1 Gbps
▶ GigabitEthernet2 ...	...	4.31%	43.13 Mbps	12.22%	122.23 Mbps	INBOUND	1 Gbps
▶ GigabitEthernet2 ...	...	0%	30.51 Kbps	0.02%	154.43 Kbps	OUTBOUND	1 Gbps
▶ GigabitEthernet3 ...	...	0.01%	110.63 Kbps	0.29%	2.93 Mbps	INBOUND	1 Gbps
▶ GigabitEthernet3 ...	...	0.01%	56.49 Kbps	0.04%	396.24 Kbps	OUTBOUND	1 Gbps
▶ GigabitEthernet4 ...	...	0%	3.52 Kbps	0.06%	594.94 Kbps	INBOUND	1 Gbps
▶ GigabitEthernet4 ...	...	0.01%	70.79 Kbps	0.18%	1.8 Mbps	OUTBOUND	1 Gbps
▶ GigabitEthernet5 ...	...	0%	346 bps	0%	2.82 Kbps	INBOUND	1 Gbps

## Troubleshooting

### Incorrect Interface Names

In the event that the generated report displays an "ifindex-#" which does not correspond to your exporter interfaces, it suggests a potential configuration issue with SNMP polling either on the SMC or on the exporter itself. In this example, I have highlighted an apparent problem with SNMP polling of a given exporter.

Interfaces (152)

Filter by Device

Interface Status (Since Reset Hour)

INTERFACE	EXPORTER	CURRENT UTILIZATION	CURRENT TRAFFIC	MAXIMUM UTILIZATION	MAX TRAFFIC	DIRECTION	SPEED
ifindex-5 ...	192.168.99.2 ...	90.93%	909.27 Mbps	162.76%	1.63 Gbps	INBOUND	1 Gbps
ifindex-8 ...	192.168.99.2 ...	85.71%	857.08 Mbps	85.71%	857.08 Mbps	OUTBOUND	1 Gbps
ifindex-26 ...	192.168.99.2 ...	85.71%	857.08 Mbps	85.71%	857.08 Mbps	INBOUND	1 Gbps
ifindex-3 ...	192.168.99.2 ...	80.46%	804.6 Mbps	82.07%	820.69 Mbps	INBOUND	1 Gbps
ifindex-25 ...	192.168.99.2 ...	79.06%	790.63 Mbps	80.29%	802.94 Mbps	OUTBOUND	1 Gbps
ifindex-16 ...	192.168.99.2 ...	79.06%	790.63 Mbps	80.29%	802.94 Mbps	INBOUND	1 Gbps
ifindex-13 ...	192.168.99.2 ...	53.29%	532.87 Mbps	94.85%	948.5 Mbps	OUTBOUND	1 Gbps
ifindex-24 ...	192.168.99.2 ...	53.29%	532.87 Mbps	94.85%	948.5 Mbps	INBOUND	1 Gbps
ifindex-0 ...	192.168.99.2 ...	0.43%	4.29 Mbps	2.58%	25.84 Mbps	OUTBOUND	1 Gbps
TenGigabitEthernet1/0/38 ...	192.168.99.2 ...	0.32%	3.17 Mbps	0.98%	9.77 Mbps	INBOUND	1 Gbps
ifindex-0 ...	192.168.99.2 ...	0.13%	1.28 Mbps	0.37%	3.66 Mbps	OUTBOUND	1 Gbps
ifindex-0 ...	192.168.99.2 ...	0.12%	1.18 Mbps	2.77%	27.74 Mbps	OUTBOUND	1 Gbps
GigabitEthernet1/0/1 ...	192.168.99.4 ...	0.1%	1 Mbps	0.32%	3.19 Mbps	INBOUND	1 Gbps
ifindex-0 ...	192.168.99.2 ...	0.06%	573.21 Kbps	1.29%	12.92 Mbps	OUTBOUND	1 Gbps
TenGigabitEthernet1/0/1 ...	192.168.99.5 ...	0.05%	531.31 Kbps	0.29%	2.86 Mbps	INBOUND	1 Gbps
TenGigabitEthernet1/0/37 ...	192.168.99.1 ...	0.05%	503.01 Kbps	2.02%	20.15 Mbps	INBOUND	1 Gbps
TenGigabitEthernet1/0/1 ...	192.168.99.2 ...	0.04%	354.1 Kbps	1.25%	12.5 Mbps	INBOUND	1 Gbps

## Missing Exporters or Interfaces

Template verification holds significant importance in the context of NetFlow data processing. Specifically, it ensures that the NetFlow template received from the exporter contains all the requisite fields required for successful decoding and processing by the Flow Collector. Failure to encounter a valid template leads to the exclusion of the associated set of flows from decoding, therefore resulting in their absence from the list of interfaces.

If you do not see the expected exporter/interfaces in the interfaces list, you should verify the incoming netflow data dn template. In order to verify the NetFlow template a packet capture can be created on the Flow Collector side, specifying the IP from the exporter we are getting NetFlow from by changing "x.x.x.x":

- Log in to the Flow Collector via SSH or console with **root** credentials.
- Run a packet capture from the exporter IP and netflow port in question:

```
tcpdump -s0 -v -nnn -i eth0 host x.x.x.x and port 2055 -w /lancope/var/admin/tmp/<name>.pcap
```

- Copy the packet capture from the appliance, to a workstation with the Wireshark application installed, use your preferred method (For example: SCP, SFTP).
- Open the packet capture with Wireshark and verify the template and data that the exporter is sending to the flow collector

Date	Source	Destination	Protocol	Length	Info	Dist Port
19:35:07.222163	10.10.10.10	10.10.10.10	CFLOW	182	total: 3 (v9) records Obs-Domain-ID= 257 [Data-Template:2856] [Option...	
19:35:07.222299	10.10.10.10	10.10.10.10	CFLOW	1416	total: 27 (v9) records Obs-Domain-ID= 257 [Data:2856]	
19:35:07.222377	10.10.10.10	10.10.10.10	CFLOW	1416	total: 27 (v9) records Obs-Domain-ID= 257 [Data:2856]	
19:35:07.222385	10.10.10.10	10.10.10.10	CFLOW	1416	total: 27 (v9) records Obs-Domain-ID= 257 [Data:2856]	
19:35:07.222388	10.10.10.10	10.10.10.10	CFLOW	1416	total: 27 (v9) records Obs-Domain-ID= 257 [Data:2856]	
19:35:07.222462	10.10.10.10	10.10.10.10	CFLOW	1416	total: 27 (v9) records Obs-Domain-ID= 257 [Data:2856]	

```

Frame 1: 182 bytes on wire (1456 bits), 182 bytes captured (1456 bits)
Ethernet II, Src: Cisco_94:b4:fc (8c:60:4f:94:b4:fc), Dst: VMware_84:49:4f (00:50:56:84:49:4f)
Internet Protocol Version 4, Src: 10.10.10.10, Dst: 10.10.10.10
User Datagram Protocol, Src Port: 23384, Dst Port: 2055
Cisco NetFlow/IPFIX
  Version: 9
  Count: 3
  SysUptime: 6981.285000000 seconds
  Timestamp: Jul 20, 2021 15:23:50.000000000 Eastern Daylight Time
  FlowSequence: 226153525
  SourceId: 257
  FlowSet 1 [id=0] (Data Template): 2856
    FlowSet Id: Data Template (V9) (0)
    FlowSet Length: 68
      Template (Id = 2856, Count = 15)
        Template Id: 2856
        Field Count: 15
        Field (1/15): BYTES
        Field (2/15): PKTS
        Field (3/15): OUTPUT_SNMP
        Field (4/15): IP_DST_ADDR
        Field (5/15): SRC_VLAN
        Field (6/15): IP_TOS
        Field (7/15): IPV4_ID
        Field (8/15): FRAGMENT_OFFSET
        Field (9/15): IP_SRC_ADDR
        Field (10/15): L4_DST_PORT
        Field (11/15): L4_SRC_PORT
        Field (12/15): PROTOCOL
        Field (13/15): FIRST_SWITCHED
  
```

Verify that the NetFlow template is using the 9 required fields, the exact name of these template fields can vary depending on the exporter type so be sure to consult the documentation for the specific exporter type you are configuring:

- Source IP Address
- Destination IP Address
- Source port
- Destination port
- Layer 4 Protocol
- Bytes count
- Packet count
- Flow Start Time
- Flow End Time

To display interfaces correctly please also add:

- interface output
- interface input


Here is an example template packet capture from an given exporter device


- Red arrows: required NetFlow fields
- Green arrows: SNMP fields

```

> User Datagram Protocol, Src Port: 51431, Dst Port: 2055
v Cisco NetFlow/IPFIX
  Version: 10
  Length: 120
  > Timestamp: Jun 20, 2023 00:24:38.000000000 CST
  FlowSequence: 41662155
  Observation Domain Id: 256
  v Set 1 [id=2] (Data Template): 260
    FlowSet Id: Data Template (V10 [IPFIX]) (2)
    FlowSet Length: 104
    v Template (Id = 260, Count = 24)
      Template Id: 260
      Field Count: 24
      > Field (1/24): IPv4 ID
      > Field (2/24): IP_SRC_ADDR ←
      > Field (3/24): IP_DST_ADDR ←
      > Field (4/24): IP_TOS
      > Field (5/24): IP_DSCP
      > Field (6/24): PROTOCOL ←
      > Field (7/24): IP TTL MINIMUM
      > Field (8/24): IP TTL MAXIMUM
      > Field (9/24): L4_SRC_PORT ←
      > Field (10/24): L4_DST_PORT ←
      > Field (11/24): TCP_FLAGS
      > Field (12/24): SRC_AS
      > Field (13/24): IP_SRC_PREFIX
      > Field (14/24): SRC_MASK
      > Field (15/24): INPUT_SNMP ←
      > Field (16/24): DST_AS
      > Field (17/24): IP_NEXT_HOP
      > Field (18/24): DST_MASK
      > Field (19/24): OUTPUT_SNMP ←
      > Field (20/24): DIRECTION
      > Field (21/24): BYTES ←
      > Field (22/24): PKTS ←
      > Field (23/24): FIRST_SWITCHED ←
      > Field (24/24): LAST_SWITCHED ←

```

 **Note:** Port listed in the example command can vary depending on your exporter configuration, default is 2055

 **Note:** Keep the packet capture running from 5-10 minutes, depending on the exporter the template can be send every N minutes and you need to catch that template so the NetFlow gets decoded correctly, if template does not show, repeat the packet capture for a longer period of time

## Connectivity Problems

Check Connectivity: Ensure that there is connectivity between SNA Manager appliance and the exporters. Verify that the exporters are reachable from the Stealthwatch management console by pinging their IP addresses. If there are any network connectivity issues, troubleshoot and resolve them accordingly.

### Validate Manager (SMC) ability to poll exporters

- Connect to SNA manager vis SSH and log in with **root** credentials
- Analyze the `/lancope/var/smc/log/smc-configuration.log` file and search for the logs of type **ExporterSnmpSession**:

```
INFO [ExporterSnmpSession] SNMP polling for 10.1.0.253 took 0s
INFO [ExporterSnmpSession] SNMP polling for 10.1.0.253 took 0s
WARN [ExporterSnmpSession] SNMP polling for 10.10.0.254 failed: java.lang.Exception: timeout
INFO [ExporterSnmpSession] SNMP polling for 10.10.0.254 took 20s
WARN [ExporterSnmpSession] SNMP polling for 10.10.0.254 failed: java.lang.Exception: timeout
INFO [ExporterSnmpSession] SNMP polling for 10.10.0.254 took 20s
```

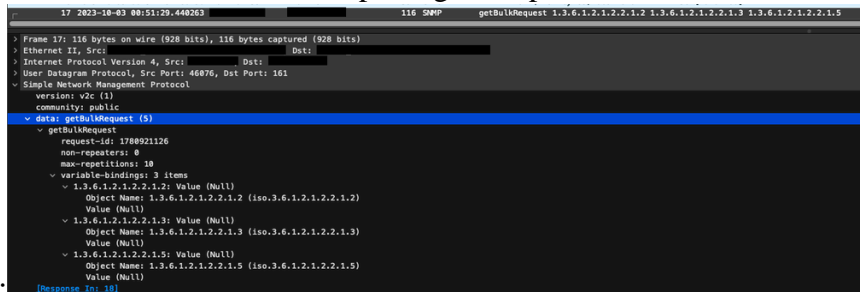
- In this polling example, there were no errors detected for exporter 10.1.0.253. However, exporter 10.1.0.254 experienced a timeout. The default timeout interval is 5000 ms with a retry count of 3. So from the time an exporter is polled to the moment it's timed out should be 20 seconds in an environment where you haven't changed the settings.

### Generate a packet capture on the SMC using the IP address of an exporter.

- Log in to the Manager node via SSH or console with **root** credentials
- Run:

```
tcpdump -s0 -v -nnn -i [Interface] host [Exporter_IP_address] -w /lancope/var/admin/tmp/[file_name]
```

- Export the packet capture from the appliance with your preferred method (Example: SCP, SFTP)
- Open the packet capture with Wireshark to view the successful polling attempts



```
17 2023-10-03 00:51:29.440263 116 SNMP getBulkRequest 1.3.6.1.2.1.2.2.1.2 1.3.6.1.2.1.2.2.1.3 1.3.6.1.2.1.2.2.1.5
> Frame 17: 116 bytes on wire (928 bits), 116 bytes captured (928 bits)
> Ethernet II, Src: [redacted], Dst: [redacted]
> Internet Protocol Version 4, Src: [redacted], Dst: [redacted]
> User Datagram Protocol, Src Port: 46076, Dst Port: 161
> Simple Network Management Protocol
  version: v2c (1)
  community: public
  data: getBulkRequest (5)
    <- getBulkRequest
      request-id: 1780921126
      non-repetaters: 0
      max-repetitions: 10
      variable-bindings: 3 items
        <- 1.3.6.1.2.1.2.2.1.2: Value (Null)
          Object Name: 1.3.6.1.2.1.2.2.1.2 (iso.3.6.1.2.1.2.2.1.2)
          Value (Null)
        <- 1.3.6.1.2.1.2.2.1.3: Value (Null)
          Object Name: 1.3.6.1.2.1.2.2.1.3 (iso.3.6.1.2.1.2.2.1.3)
          Value (Null)
        <- 1.3.6.1.2.1.2.2.1.5: Value (Null)
          Object Name: 1.3.6.1.2.1.2.2.1.5 (iso.3.6.1.2.1.2.2.1.5)
          Value (Null)
    [Response: In: 18]
```

- Request made from the SMC:
- SNMP Response from the exporter with interface information:

```

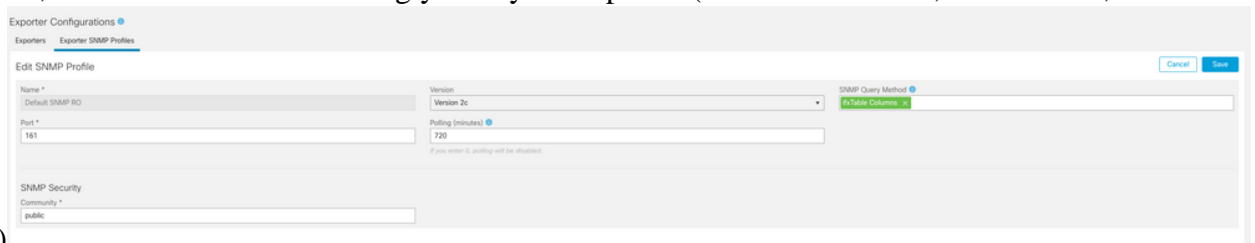
18 2023-10-03 00:51:29.442155 740 SNMP get-response 1.3.6.1.2.1.2.2.1.2.1 1.3.6.1.2.1.2.2.1.3.1 1.3.6.1.2.1.2.2.1.5.1
> Frame 18: 740 bytes on wire (5920 bits), 740 bytes captured (5920 bits)
> Ethernet II, Src: , Dst:
> Internet Protocol Version 4, Src: , Dst:
> User Datagram Protocol, Src Port: 161, Dst Port: 46876
> Simple Network Management Protocol
  version: v2c (1)
  community: public
  > data: get-response (2)
    > get-response
      request-id: 1780921126
      error-status: noError (0)
      error-index: 0
      > variable-bindings: 30 items
        > 1.3.6.1.2.1.2.2.1.2.1: "GigabitEthernet1"
          Object Name: 1.3.6.1.2.1.2.2.1.2.1 (iso.3.6.1.2.1.2.2.1.2.1)
          Value (OctetString): "GigabitEthernet1"
        > 1.3.6.1.2.1.2.2.1.3.1: 6
          Object Name: 1.3.6.1.2.1.2.2.1.3.1 (iso.3.6.1.2.1.2.2.1.3.1)
          Value (Integer32): 6
        > 1.3.6.1.2.1.2.2.1.5.1: 1000000000
          Object Name: 1.3.6.1.2.1.2.2.1.5.1 (iso.3.6.1.2.1.2.2.1.5.1)
          Value (Gauge32): 1000000000
        > 1.3.6.1.2.1.2.2.1.2.2: "GigabitEthernet2"
          Object Name: 1.3.6.1.2.1.2.2.1.2.2 (iso.3.6.1.2.1.2.2.1.2.2)
          Value (OctetString): "GigabitEthernet2"
        > 1.3.6.1.2.1.2.2.1.3.2: 6
          Object Name: 1.3.6.1.2.1.2.2.1.3.2 (iso.3.6.1.2.1.2.2.1.3.2)
          Value (Integer32): 6
        > 1.3.6.1.2.1.2.2.1.5.2: 1000000000
          Object Name: 1.3.6.1.2.1.2.2.1.5.2 (iso.3.6.1.2.1.2.2.1.5.2)
          Value (Gauge32): 1000000000
        > 1.3.6.1.2.1.2.2.1.2.3: "GigabitEthernet3"
          Object Name: 1.3.6.1.2.1.2.2.1.2.3 (iso.3.6.1.2.1.2.2.1.2.3)
          Value (OctetString): "GigabitEthernet3"
        > 1.3.6.1.2.1.2.2.1.3.3: 6
          Object Name: 1.3.6.1.2.1.2.2.1.3.3 (iso.3.6.1.2.1.2.2.1.3.3)
          Value (Integer32): 6

```

## Validate SNMP Polling Settings

Make sure the polling intervals are appropriate and that the desired metrics are included in the SNMP queries

- On the web UI navigate to: **Configure -> Exporters -> Exporter SNMP Profiles:**
- Validate that the correct SNMP port (typically UDP port 161) and the correct SNMP Query Method selected, these must match accordingly with your exporter (ifxTable Columns, CatOS MIB, PanOS



MIB)

**Note:** If you have 10 Gbps interfaces, we recommend that you choose the ifxTable columns option for the SNMP query method.

**Note:** For optimal system performance, set SNMP polling to a 12-hour interval. Polling more frequently does not make your utilization metrics more up to date and can cause your system to run slower.

- Validate that the SNMP versions configured on both SNA and the exporters are compatible. SNA supports SNMPv1, SNMPv2c, and SNMPv3. Check if the exporters are configured to use the same SNMP version as configured in SNA.
  - In case of using SNMPv3, verify the SNMP configuration is correct (Username, Authentication Password, Authentication Protocol, Privacy Password, Privacy Protocol)

## Live troubleshooting of SNMP Polling

On the web UI navigate to **Configure -> Exporters -> Exporter SNMP Profiles**

- Set Polling (minutes) to 1 (minute) temporarily.

The screenshot shows the 'Edit SNMP Profile' interface. The 'Polling (minutes)' field is highlighted with a red box and contains the value '1'. Other fields include Name (Default SNMP RG), Port (161), Version (Version 3), SNMP Query Method, User Name (admin), Security (Authentication), and Authentication Protocol (HMAC\_MD5).

- Log in to the SMC via SSH or console with **root** credentials.
- Navigate to this folder:

```
cd /lancope/var/smc/log
```

- Run:

```
tail -f smc-configuration.log
```

- For SNMPv3, a common error message would be:

```
failed: java.lang.IllegalArgumentException: USM passphrases must be at least 8 bytes long (RFC3414)
```

- Verify the authentication password in the SNMP Profile is set to 8 characters or more.
- Once live troubleshooting is finished, return Polling (minutes) configuration for the exporter or its configuration template to its previous value.

## Testing SNMP Polling From Another Device

Test SNMP Polling: Manually initiate an SNMP poll from a local machine to a specific network device and check if it receives a response. This can be done by using SNMP polling tools or utilities like SNMPwalk. Verify that the network device responds with the requested SNMP data. If there is no response, it indicates a problem with the SNMP configuration or connectivity.

- On your local machine with SNMPwalk software, replace "x.x.x.x" for the exporter IP and run on CLI:

```
snmpwalk -v2c -c public x.x.x.x
```

- -v2c: specifies SNMP version to use
- -c: sets the community string



```
% snmpwalk -v2c -c public 1
SNMPv2-MIB::sysDescr.0 = STRING: Cisco IOS Software [Amsterdam], Virtual XE Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 17.3.4a, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2021 by Cisco Systems, Inc.
Compiled Tue 20-Jul-21 04:
SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.9.1.1537
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (373833542) 43 days, 6:25:35.42
SNMPv2-MIB::sysContact.0 =
SNMPv2-MIB::sysName.0 = STRING:
SNMPv2-MIB::sysLocation.0 = STRING: cxlabs
SNMPv2-MIB::sysServices.0 = INTEGER: 78
SNMPv2-MIB::sysORLastChange.0 = Timeticks: (0) 0:00:00.00
IF-MIB::ifNumber.0 = INTEGER: 10
IF-MIB::ifIndex.1 = INTEGER: 1
IF-MIB::ifIndex.2 = INTEGER: 2
IF-MIB::ifIndex.3 = INTEGER: 3
IF-MIB::ifIndex.4 = INTEGER: 4
IF-MIB::ifIndex.5 = INTEGER: 5
IF-MIB::ifIndex.6 = INTEGER: 6
IF-MIB::ifIndex.7 = INTEGER: 7
IF-MIB::ifIndex.8 = INTEGER: 8
IF-MIB::ifIndex.9 = INTEGER: 9
IF-MIB::ifIndex.10 = INTEGER: 10
IF-MIB::ifDescr.1 = STRING: GigabitEthernet1
IF-MIB::ifDescr.2 = STRING: GigabitEthernet2
IF-MIB::ifDescr.3 = STRING: GigabitEthernet3
IF-MIB::ifDescr.4 = STRING: GigabitEthernet4
IF-MIB::ifDescr.5 = STRING: GigabitEthernet5
IF-MIB::ifDescr.6 = STRING: VoIP-Null0
IF-MIB::ifDescr.7 = STRING: Null0
IF-MIB::ifDescr.8 = STRING: GigabitEthernet6
IF-MIB::ifDescr.9 = STRING: GigabitEthernet7
IF-MIB::ifDescr.10 = STRING: Tunnel1
IF-MIB::ifType.1 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifType.2 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifType.3 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifType.4 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifType.5 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifType.6 = INTEGER: other(1)
```

- Verify the exporter responds with SNMP data

## Related information

- For additional assistance, please contact Technical Assistance Center (TAC). A valid support contract is required: [Cisco Worldwide Support Contacts](#).
- You can also visit the Cisco Security Analytics Community [here](#).
- [Technical Support & Documentation - Cisco Systems](#)